U.S. Department
of Transportation

**Pipeline and
Hazardous Materials
Safety Administration**

**East Building, PHH-23
1200 New Jersey Avenue SE
Washington, D.C. 20590**

COMPETENT AUTHORITY CERTIFICATION FOR A TYPE B(U) RADIOACTIVE MATERIALS PACKAGE DESIGN CERTIFICATE USA/9320/B(U)-96, REVISION 1

This certifies that the radioactive material package design described has been certified by the Competent Authority of the United States as meeting the regulatory requirements for a Type B(U) packaging for radioactive material as prescribed in the regulations of the International Atomic Energy Agency[1] and the United States of America[2].

1. Package Identification - MIDUS.

2. Package Description and Authorized Radioactive Contents - as described in U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9320, Revision 1 (attached).

3. General Conditions -

   a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.

   b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Hazardous Materials Technology, (PHH-23), Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.

   c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

   d. Records of Quality Assurance activities required by Paragraph 310 of the IAEA regulations[1] shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.

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[1] "Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised)," published by the International Atomic Energy Agency(IAEA), Vienna, Austria.

[2] Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

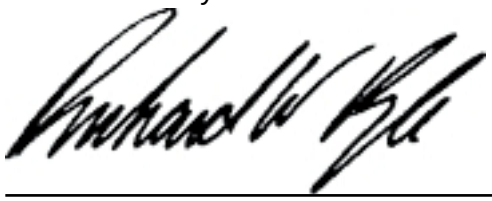
CERTIFICATE USA/9320/B(U)-96, REVISION 1

4. Marking and Labeling - The package shall bear the marking USA/9320/B(U)-96 in addition to other required markings and labeling.

5. Expiration Date - This certificate expires on May 31, 2012. On August 31, 2009, this certificate supersedes all previous revisions of USA/9320/B(U)-96.

This certificate is issued in accordance with paragraph 808 of the IAEA Regulations and Section 173.471 of Title 49 of the Code of Federal Regulations, in response to the October 10, 2008 petition by Energy Solutions, Campbell, CA, and in consideration of other information on file in this Office.

Certified By:



Robert A. Richard
Deputy Associate Administrator for Hazardous Materials Safety

Nov 06 2008
(DATE)

Revision 1 - Issued to endorse U.S. Nuclear Regulatory Commission Certificate of Compliance 9320, Revision 1.

NRC FORM 618
(8-2000)
10 CFR 71

U.S. NUCLEAR REGULATORY COMMISSION

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE		PAGES
9320	1	71-9320	USA/9320/B(U)-96	1	OF	3

2. PREAMBLE

a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."

b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

a. ISSUED TO *(Name and Address)*

EnergySolutions Spent Fuel Division
2105 South Bascom Ave., Suite 160
Campbell, CA 95008

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

EnergySolutions Spent Fuel Division application dated June 20, 2008.

4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

(1) Model No.: MIDUS

(2) Description

A depleted-uranium shielded package for the transport of medical isotopes. The package has two primary components: (1) an inner cask assembly that provides containment of the radioactive material and radiation shielding, and (2) an overpack that provides impact and thermal protection.

The cask assembly consists of the cask body, closure lid, shield plug, and shield lid. The cask body is a monolithic, machined 2.5-mm thick stainless steel containment vessel, surrounded by approximately 62 mm of depleted uranium gamma shielding, and a 4-mm thick stainless steel outer shell. The containment system closure lid is a 19-mm thick stainless steel plate which is attached to the cask body by 8, M10 X 1.5 X 30 socket head cap screws. The containment system is sealed by two concentric ethylene propylene O-rings, and the lid is equipped with a leak test port. A stainless steel clad depleted uranium shield plug in the cask cavity and a shield lid that is installed over the closure lid provide shielding at the top end of the package. The overpack base and lid are constructed of thin stainless steel shells filled with rigid polyurethane foam. The overpack lid is attached to the base by eight recessed alloy steel bolts. The overpack lid is equipped with four stainless steel lugs for lifting and tie-down, and the overpack base has a bottom flange with four lugs that may also be used for tie-down.

5.(a) (2) Description (Continued)

The approximate dimensions and weight of the package are:

Overall package outer diameter	520 mm
Overall package height	551 mm
Cask assembly diameter	225 mm
Cask assembly height	347 mm
Cask cavity inner diameter	85 mm
Cask cavity inner height	134 mm
Maximum package weight	330 kg

(3) Drawings

The packaging is constructed and assembled in accordance with EnergySolutions Drawing Nos.:

TYC01-1601, Sheets 1 and 2, Rev. 0	General Arrangement of Packaging and Contents
TYC01-1602, Sheets 1 through 4, Rev. 1	General Arrangement of Cask Assembly
TYC01-1603, Sheets 1 through 3, Rev. 1	General Arrangement of Overpack Assembly
TYC01-1604, Sheets 1 through 3, Rev. 1	Containment System
TYC01-1605, Sheets 1 and 2, Rev. 0	Closure Devices
TYC01-1606, Sheets 1 through 3, Rev. 0	Gamma Shielding
TYC01-1607, Sheets 1 and 2, Rev. 0	Heat Transfer Features
TYC01-1608, Sheet 1, Rev. 0	Energy Absorbing Features
TYC01-1609, Sheets 1 and 2, Rev. 0	Lifting and Tie-Down Devices

(b) Contents

(1) Type and form of material

Molybdenum-99 with its daughter products as natrium molybdate (NaNO3 1M / NaOH 0.2M) in liquid form.

The liquid may be contained within product bottles, consisting of stainless steel flasks with stainless steel caps, with or without elastomeric seals. Various stainless steel components may be used as dunnage. The total volume of the payload hardware may not exceed 125 ml (as indicated by a maximum mass of 1.0 kg).

(2) Maximum quantity of material per package

4,400 Ci molybdenum-99. The maximum specific activity is 60 Ci/ml Mo-99. The product volume may vary from 0 to 150 ml.

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6. In addition to the requirements of Subpart G of 10 CFR Part 71:

   (a) The package shall be prepared for shipment and operated in accordance with the Package Operations in Section 7.0 of the application. Optional polymeric dunnage may be placed in the space between the cask assembly and the overpack.

   (b) The package must meet the Acceptance Tests and Maintenance Program in Section 8.0 of the application.

7. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.

8. Revision No. 0 of this certificate may be used until August 31, 2009.

9. Expiration date: May 31, 2012.

REFERENCES

EnergySolutions Spent Fuel Division application dated June 20, 2008.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Eric J. Benner, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Date: August 28, 2008

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION REPORT
Docket No. 71-9320
Model No. MIDUS Package
Certificate of Compliance No. 9320
Revision No. 1

SUMMARY

By application dated June 20, 2008, EnergySolutions Spent Fuel Division requested an amendment to Certificate of Compliance No. 9320, for the Model No. MIDUS package. EnergySolutions requested changes to (1) the packaging description that would clarify certain dunnage may be used, and (2) changes in the periodic and maintenance leakage testing. EnergySolutions provided an updated application that incorporated the requested changes. The updated application supersedes in its entirety the previous revision of the application dated March 20, 2007.

The Certificate of Compliance has been revised as requested by the applicant. Based on the statements and representations in the application, the staff concluded that these changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

EVALUATION

EnergySolutions provided an updated package application by letter dated June 20, 2008. The applicant also requested the following changes to the package:

- Optional use of polymeric dunnage between the cask assembly and the overpack to minimize scuffing and other wear.
- Modifications to the leakage test performed periodically and after certain maintenance activities, including containment seal replacement.

The applicant provided revised pages in the package application. The optional use of polymeric dunnage does not affect the package performance under normal or accident conditions, nor does it serve a safety function. The dunnage is intended to reduce scuffing and wear between the metal components of the cask assembly and the overpack. The optional use of this dunnage does not affect the safe performance of the package. Condition No. 6(a) of the certificate has been revised to clarify that polymeric dunnage may be placed in the space between the cask assembly and the overpack.

The applicant provided a revised Section 8.2.2, which describes the leakage tests performed periodically (at least annually) and after certain maintenance activities, including containment seal replacement. The revisions to the leakage test description are minor in nature, and address operational changes, including use of a reduced partial pressure of the helium in the cask cavity. The reduced partial pressure is considered when evaluating the measured leakage. This method is consistent with ANSI N14.5-1997, Leakage Tests on Packages for Shipment. The minimum test sensitivity and the acceptance standard (1 x 10-7 ref-cm3/s) for the tests were not changed. Based on this the staff agrees that the changes are acceptable.

CONCLUSIONS

The Certificate of Compliance has been amended as requested by the applicant. The certificate has been revised to reference the updated package application, which superseded the previous revision of the application. Condition No. 6(a) has been revised to clarify that polymeric dunnage may be placed in the space between the cask assembly and the overpack. Condition No. 8 has been added that allows use of the previous edition of the certificate for a period of approximately one year.

The staff agrees that these changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9320,
Revision No. 1, on August 28,2008.

U.S. Department
of Transportation

**Pipeline and
Hazardous Materials
Safety Administration**

**East Building, PHH-23
1200 New Jersey Avenue SE
Washington, D.C. 20590**

CERTIFICATE NUMBER: USA/9320/B(U)-96, Revision 1

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